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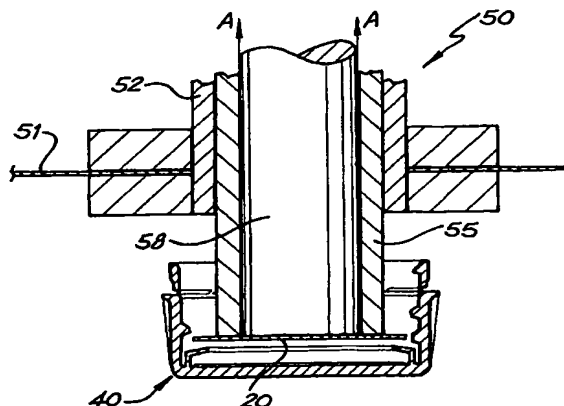
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[Continued on next page]

(54) Title: METHOD OF INSERTING A BARRIER LINER INTO A CLOSURE



(57) Abstract: The present invention relates to a method and apparatus for positioning a disc, such as a barrier disc (20), in a closure (40). In particular, the invention relates to a method and apparatus for positioning a barrier disc (20) in a self-sealing moulded plastic closure (40) having a sealing fin arrangement (22) for providing a seal when the closure (40) is appropriately applied to a finish of a container (30). The method comprises the steps of providing a barrier disc (20) in a position ready for insertion within the closure (40); pressing the barrier disc (20) relatively into the closure (40) such that at least a portion of the disc (20) is positioned at least adjacent the top panel thereof; and applying a fluid pressure to the barrier disc (20) such that the entire disc is forced into a position at least adjacent the top panel. The apparatus comprises an insertion station for supporting the closure (40) through the disc positioning process and a tool (50) that is movable relative to the insertion station to drive the disc (20) relatively into the closure (40). The tool (50) comprises a plunger (55) adapted to press the disc (20) into the closure (40) such that at least a portion of the disc (20) is adjacent the top panel thereof, and a fluid flow passage through which fluid travels to apply fluid pressure to the disc (20) and force the entire disc (20) past the sealing fin (22) and into a position at least adjacent the top panel.



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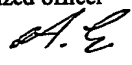
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU03/00906

A. CLASSIFICATION OF SUBJECT MATTER		
Int. Cl. ⁷ : B65D 53/04, 51/14, 41/04, B21D 51/46, B29C 70/68, B29L 31:56		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) REFER ELECTRONIC DATABASE CONSULTED BELOW		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched AU: IPC B65D 53/04, 51/14, B29C 70/68, B29L 31:56, B21D 51/46		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) DWPI IPC B67B, B65D, B65B, B29D 1/00, 31/-, B29L 31/56 and keywords: CLOSURE, CAP, LID, DISK, LINER, SEAL, AIRTIGHT, PRESS, INSERT, FIN, RIB, PROJECTION, METHOD, STEP and similar terms DWPI IPC B30B, B26F, B26D, B29C 71/00, 70/68, 70/80, 73/30, B29L 1/00, 31/56, B67B 1/00, 1/10, 3/00 and keywords: PLUNGER, PUSHER, LUMEN, PRESS, INSERT, FORCE, FLUID, AIR, BORE, PASSAGE, ADJACENT, WITHIN, ABUT, DISC, LINER, CLOSURE and similar terms DWPI IPC B21D 51/46 ESP@CENET and keywords: B21D 51/46 AND (AIR OR GAS)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	US 2003/0057175 A1 (WILLINGHAM et al.) 27 March 2003 See whole document - eg figures 2 and 3	1, 2, 4
X	EP 915028 A2 (OWENS-ILLINOIS CLOSURE, INC.) 12 May 1999 See whole document	1, 4
Y	See whole document	2
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex		
<p>* Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" Later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" Document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" Document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" Document member of the same patent family</p>		
Date of the actual completion of the international search 9 September 2003		Date of mailing of the international search report 10 SEP 2003
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929		Authorized officer  ADRIANO GIACOBETTI Telephone No : (02) 6283 2579

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 073334 B1 (H-C INDUSTRIES, INC.) 19 November 1987	1, 4
Y	See whole document	2
X	US 4997097 A (KRAUTKRAMER) 5 March 1991	1, 4
Y	See whole document	2
X	US 4685580 A (TOWNS et al.) 11 August 1987	1, 4
Y	See whole document	2
Y	US 5782369 A (TANSEY) 21 July 1998	2
	See figures 1 to 11 - Annular sealing fin (13)	
Y	US 6082569 A (DRUITT) 4 July 2000	2
	See whole document. Eg figures 1 to 7 - Annular sealing fin (6)	
A	US 4230028 A (KNUDSEN) 28 October 1980	18-32
	See whole document - eg figures 7, 8, 9a, 9b	
A	US 3959061 A (RENCK et al.) 25 May 1976	18-32
	See whole document - eg figures 1 to 7	
A	US 4728239 A (KIERAN et al.) 1 March 1988	18-32
	See whole document - eg figures 4A to 5C	

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Supplemental Box

(To be used when the space in any of Boxes I to VIII is not sufficient)

Continuation of Box No: Box II

The international application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept. In coming to this conclusion the International Searching Authority has found that there are different inventions as follows:

1. Claims 1 to 17 are directed to a method of forming a closure for application to a container. The method comprises the steps of providing a closure having a top panel and a skirt depending from the top panel; providing a disc in a position ready for insertion within the closure; and pressing the disc relatively into said closure such that at least a portion of said disc is positioned at least adjacent the top panel. It is considered that the steps of the method of forming a closure comprises a first "special technical feature".
2. Claims 18 to 32 are directed to an apparatus for positioning a disc in a closure. The apparatus comprises an insertion station for supporting a closure for at least a portion of the disc positioning process, and a tool movable relative to the insertion station to relatively drive a disc into the closure, wherein the tool comprises a plunger for relatively pressing said disc into said closure such that at least a portion of the disc is adjacent a top panel, and a fluid flow passage through which travels to apply fluid pressure to the disc and force the entire disc past a sealing fin on the closure and into a position at least adjacent the top panel. It is considered that the combination of features defining the apparatus, per se comprises a second "special technical feature".

These groups are not so linked as to form a single general inventive concept, that is, they do not have any common inventive features, which define a contribution over the prior art. The common concept linking together these groups of claims is a closure having a top panel, a skirt depending from the top panel, and a disc positioned at least adjacent the top panel. However this concept is not novel in the light of the prior art information contained in the following documents below and the documents cited in this Report:

- (a) AU 25050/95 A (RICAL S.A.) 1 February 1996
- (b) AU 64594/86 A (TBL DEVELOPMENT CORPORATION) 25 June 1987
- (c) AU 27137/95 A (YAMAMURA GLASS CO., LTD.) 22 February 1996
- (d) EP 94026 A (ANCHOR HOCKING CORPORATION) 16 November 1983

Therefore these claims lack unity a posteriori.

As the search for the second invention will require more than a little additional search effort over that for the first invention, an additional search fee is warranted.

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Box I Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos :
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos :
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos :
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box II Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See Supplemental Sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☒ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

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This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member			
US	2003057175	BR	200203834	CA	2403248	CN	1420064
		EP	1295804	HU	200203048	JP	2003104406
		PL	356199				
EP	915028	AU	90471/98	BR	9804738	JP	11198957
		US	5997684	ZA	9809933		
EP	73334	AR	230239	AU	85551/82	AU	85552/82
		BR	8204327	BR	8204330	CA	1190519
		CA	1215206	CA	1289104	EP	72924
		EP	224649	ES	514301	ES	8400967
		ES	525302	ES	8500125	GB	2102776
		GB	2108892	JP	58030949	JP	58051116
		JP	63096052	MX	156662	MX	157545
		US	4418828	ZA	8204808	ZA	8205312
		US	4407422	DE	3237764	FR	2514326
		IT	1156206	US	4497765	AR	226863
		AU	63343/80	BR	8008835	EP	25991
		JP	62122964	MX	151062	WO	8100838
		US	4378893	AU	63392/80	BR	8008834
		CA	1168812	EP	26405	MX	151733
		US	4343754	WO	8100822		
US	4997097	DE	3839351	EP	370272		
US	4685580	AU	64599/86	BR	8700020	CA	1271961
		DK	33/87	EP	242447	FI	864835
		JP	62251356	NO	864866	NZ	218120
		ZA	8608400				
US	5782369	AU	74544/94	BR	9407354	CA	2169725
		CN	1104167	EP	714367	HU	74492
		IL	110654	IN	181348	NZ	271041
		PL	313035	SG	43080	WO	9505321
		ZA	9406320				
<u>CONTINUED NEXT PAGE</u>							

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US	6082569	AU	37737/89	BR	8907495	CA	1322187
		DK	2984/90	EP	481981	HK	419/95
		HU	56782	NO	905371	NZ	229579
		SG	232/95	US	5423444	US	5638972
		US	5836464	US	6325228	US	2002027123
		WO	8912584				
US	4230028	NONE					
US	3959061	NONE					
US	4728239	NONE					
END OF ANNEX							